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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
HARRINGTON, ALICIA M	

ART UNIT	PAPER NUMBER
2873	

DATE MAILED: 12/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/549,464	MCGREGOR ET AL.	
	Examiner	Art Unit	
	Alicia M Harrington	2873	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

P riod for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *8/12/03*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-43* is/are pending in the application.

4a) Of the above claim(s) *31-43* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 May 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

Election/Restrictions

1. Applicant's election of claims 1-30 in Paper No. 7 is still acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1,3-7,9-16, and 26-29 rejected under 35 U.S.C. 103(a) as being unpatentable over Kliever (US 4,574,197) in view of Fergason (US 6,379,009).

Regarding claim 1, Kliever discloses a dual field of view sensor for infrared night viewing system for implementing the claimed method comprising:

Detecting optically invisible radiation (see col. 2,lines 11-67 and col. 3, lines 1-9 and 40-67);

Processing the signals to obtain stereo data;

Displaying the stereoscopic data in the form of optically invisible radiation images superimposed on the night environment (see col. 3, lines 30-35 and col.4, lines 1-9) so the user can obtain a 3D view of the radiation by utilizing natural human stereo imaging. Although Kliever clearly teaches using a stereoscopic image data to view a scene using infrared radiation, Kliever fails to specifically disclose an embodiment where the view doesn't interfere with the user's view of the environment/scene.

In the same field of endeavor, Fergason teaches using non-visible energy as radiation source to produce a visible image and superimpose upon the actual object in the scene (see col. 4,lines 35-40 and col. 7,lines 35-40) so the displayed image doesn't interfere with user view of the environment. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kliever, as taught by Fergason, to allow the viewer to see the actual scene and decreases the chance a viewer will be unable to see anything due to equipment failure.

Regarding claim 3, as discussed above in claim 1, the HMD is night vision and the environment is an outdoor scene, thus, is an optically visible environment.

Regarding claim 4, Kliever discloses a dual imager HMD for infrared detection.

In the same field of endeavor, Fergason teaches using non-visible energy (infrared or x-ray- see abstract) as radiation source to produce a visible image and superimpose upon the actual object in the scene (see col. 4,lines 35-40 and col. 7,lines 35-40) so the displayed image doesn't interfere with user view of the environment. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kliever, as taught by Fergason, to allow the viewer to see the actual scene and decreases the chance a viewer will be unable to see anything due to equipment failure.

Regarding claim 5, Kliever fails to specifically disclose energizing material. Fergason discloses turning x-ray image to visible images displayed using a HMD system. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a detecting imager with an energizing material to produce x-ray images, since this

material is implemented in x-ray imaging systems and Fergason teaches x-ray imaging in HMD system.

Regarding claim 6, Kliever discloses a system is an infrared detection system (see abstract).

Regarding claim 7, Kliever discloses a dual field of view sensor for infrared night viewing system comprising:

Detector subsystem for detecting optically invisible radiant (see col. 2,lines 11-67 and col. 3, lines 1-9 and 40-67);

Signal processor for processing the signals to obtain stereo data;

Display subsystem for displaying the stereoscopic data in the form of optically invisible radiation images superimposed on the night environment (see col. 3, lines 30-35 and col.4, lines 1-9) so the user can obtain a 3D view of the radiation by utilizing natural human stereo imaging. Although Kliever clearly teaches using a stereoscopic image data to view a scene using infrared radiation, Kliever fails to specifically disclose an embodiment where the view doesn't interfere with the user's view of the environment/scene.

In the same field of endeavor, Fergason teaches using non-visible energy as radiation source to produce a visible image and superimpose upon the actual object in the scene (see col. 4,lines 35-40 and col. 7,lines 35-40) so the displayed image doesn't interfere with user view of the environment. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kliever, as taught by Fergason, to allow the viewer to see the actual scene and decreases the chance a viewer will be unable to see anything due to equipment failure.

Regarding claim 9, as discussed above in claim 1, the HMD is night vision and the environment is an outdoor scene, thus, is an optically visible environment.

Regarding claim 10, Kliever discloses a dual imager HMD for infrared detection.

In the same field of endeavor, Fergason teaches using non-visible energy (infrared or x-ray- see abstract) as radiation source to produce a visible image and superimpose upon the actual object in the scene (see col. 4,lines 35-40 and col. 7,lines 35-40) so the displayed image doesn't interfere with user view of the environment. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kliever, as taught by Fergason, to allow the viewer to see the actual scene and decreases the chance a viewer will be unable to see anything due to equipment failure.

Regarding claim 11, Kliever fails to specifically disclose energizing material. Fergason discloses turning x-ray image to visible images displayed using a HMD system. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a detecting imager with an energizing material to produce x-ray images, since this material is implemented in x-ray imaging systems and Fergason teaches x-ray imaging in HMD system.

Regarding claim 12, Kliever system is an infrared detection system (see abstract).

Regarding claim 13-14, Kliever discloses using a single detector for providing multiple images. Fergason discloses using a CCD for imaging (see col. 7,liens 40-45). However, it is well known that a radiation detector system uses a set of area or point detectors- the Examiner takes official Notice to that fact. Thus, it would have been obvious to one of ordinary skill in the art at

the time the invention was made to modify Kliever, to provide a set of detectors to take image, since it is a functional equivalent and would provide increase resolution.

Regarding claims 15-16, Kliever fails to specifically disclose whether the detector subsystem is active or passive. Fergason implements imagers using CCD technology. Further, active or passive detectors used in infrared detection systems are well known- the Examiner takes official notice to that fact. Therefore, Kliever and Fergason disclose the claimed invention with the exception incorporating a particular type of detector, thus, it appears the invention would work equally as well with an active or passive detector, therefore active or passive detection lacks criticality since Kliever provides the claimed function.

Regarding claim 26, Kliever discloses a stereoscopic imaging system (see abstract).

Regarding claim 27, Kliever fails to specifically disclose the detector subsystem is portable. Fergason discloses the system is implemented in a HUD (see figure 2). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kliever, to provide a portable detector system, as it increases the versatility of the system and is known in the prior art to be portable.

Regarding claim 28-29, Kliever and Fergason disclose the display system for use with a HMD display. Fergason, in an embodiment, also discloses a tracking subsystem can be used with the display (see col. 6, lines 10-35). However, it is notoriously well known in the art to incorporate stereoscopic viewing in HMD where the HMD includes a see through display and tracking system, official notice is taken to this fact. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kliever and Fergason, since

it is well known in HMD display environments, and it provides stereo and real scene viewing to the user by using data to determine the position or looking points of the user.

4. Claims 2,8,30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kliever (US 4,574,197) in view of Fergason (US 6,379,009), further in view of Inami (US 6,283,598). Regarding claim 2, Kliever discloses, as discussed in claim1, a dual imager HMD (96) for infrared detection. Fergason discloses a supplemental/programmed view and detected view can be shown simultaneously (see col. 7,lines 45-50). However, Kliever and Fergason fail to specifically disclose an embodiment where the HMD is implement in a virtual environment.

In a related field of endeavor, Inami discloses embodiments of a system for projecting images to the right and left eye of the user in a HMD to produce a 3-D image of an x-ray image for the user to see the image overlaid in the visible or virtual environment (see col. 5,lines 1-20 and col. 6, lines 34-60). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kliever and Fergason, as taught by Inami, to provide visible image of radiation in a HMD, since converting x-ray images into visible imaging is known to HMD, it is known to provide the visible radiation images in a virtual environment, and it increases the application of the system in the real world from using it in night vision (car navigation etc) to medical imaging.

Regarding claim 8, Kliever discloses, as discussed in claim 7, a dual imager HMD for infrared detection. Fergason discloses a supplemental/programmed view and detected view can be shown simultaneously (see col. 7,lines 45-50). However, Kliever and Fergason fail to specifically disclose an embodiment where the HMD is implemented in a virtual environment.

In a related field of endeavor, Inami discloses embodiments of a system for projecting images to the right and left eye of the user in a HMD to produce a 3-D image of an x-ray image for the user to see overlaid in the visible or virtual environment (see col. 5,lines 1-20 and col. 6, lines 34-60). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kliever and Fergason, as taught by Inami, to provide visible image of radiation in a HMD, since converting x-ray imaging into visible imaging is known to HMD, it is known to create visible radiation images in a virtual environment, and it increases the application of the system in the real world from using it in night vision (car navigation etc) to medical imaging.

Regarding claim 30, as discussed in claim 7 above, Kliever and Ferguson fail to specifically disclose the system provides real time visual feedback and relative strength of at least on radiation source. Inami discloses a stereoscopic HMD embodiment with real time feedback (see col. 6,lines 38-60) of the stereoscopic images. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kliever and Fergason, as taught by Inami, to provide real time updates of projected images to account for change of the object in the environment which would be critical in military or health environments. However, Kliever, Fergason and Inami fail to specifically disclose showing the relative strength of the radiation-emitting source. Although, a HMD displays that display system or object information in addition to the image is notoriously well known in the art. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made that optically invisible radiation system could provide strength data of at least one radiation source to user and that such implementation as claimed lacks criticality.

5. Claims 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kliever (US 4,574,197) in view of Fergason (US 6,373,055), further in view of Schoolman (US 5,493,595).

Regarding claim 17, Klievers' system for stereo HMD where the stereo image is produced from infrared radiation using a single detector. Fergason discloses detection of infrared or x-ray. And Kliever and Fergason fail to specifically disclose an embodiment using gamma radiation to provide visible images for stereo viewing.

In the same field of endeavor, Schoolman ('595) discloses using various types of radiation (such as gamma or x-ray) to provide visible stereoscopic 3D data to the user (see col. 9,lines 55-62, col. 10,liens 63-67,col. 11,lines 1-27, col. 12, lines 58-66) that was produced from a detector array. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kliever and Fergason, as taught by Schoolman ('595) to expand/improve non invasive surgical imaging techniques in nuclear medicine incorporating HMD systems. Further, gamma radiation images are well known to be produced by using a pair of gamma radiation detectors. Thus, it would have also been obvious to one of ordinary skill in the art at the time the invention was made to provide gamma radiation images for stereo viewing using a pair of gamma cameras, since it is well known in the art of gamma radiation imaging.

Regarding claim 18, as discussed in claim 17, Schoolman teaches using gamma radiation to produce stereo images. Schoolman also teaches implementing a gamma radiation image using a scanning gamma camera (see col. 10,lines 5-10). However, Kliever, Fergason and Schoolman fail to specifically disclose the cameras are scanned through a plurality of angles to locate a source within the environment. However, a gamma ray scanning camera for taking images at

plurality of angles to output three-dimensional images is well known in the art. These images identify detected radiation events of a source to produce multiple sets of data. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kliever, Fergason and Schoolman, to incorporate scanning gamma ray cameras, since there usage in 3D imaging is well known to provide an quality output image on a display.

Regarding claim 19, Klievers' system for stereo HMD where the stereo image is produced from infrared radiation using a single detector. Fergason discloses detection of infrared or x-ray. Fergason and Kliever fail to disclose an embodiment using gamma radiation to provide visible images for stereo viewing.

In the same field of endeavor, Schoolman ('595) discloses using various types of radiation (such as gamma or x-ray) to provide visible stereoscopic 3D data to the user (see col. 9,lines 55-62, col. 10,liens 63-67,col. 11,lines 1-27, col. 12, lines 58-66) that was produced from a detector array where the detector includes a collimator for directing radiation onto the scintillator (see col. 11,liens 10-20). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kliever, to provide images from gamma radiation detectors that provide quality radiation images using a known structure of a collimator and scintillator pair.

6. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kliever in view of Fergason ('009) and Schoolman ('595), as applied to claim 19 above, further in view of Jeanguillaume (US 5,448,073).

Regarding claim 20, Klievers' system for stereo HMD where the stereo image is produced from infrared radiation using a single detector. Kliever and Fergason fail to disclose an embodiment using gamma radiation to provide visible images for stereo viewing.

In the same field of endeavor, Schoolman ('595) discloses using various types of radiation (such as gamma or x-ray) to provide visible stereoscopic 3D data to the user (see col. 9,lines 55-62, col. 10,liens 63-67,col. 11,lines 1-27, col. 12, lines 58-66) that was produced from a detector array where the detector includes a collimator for directing radiation onto the scintillator (see col. 11,lines 10-20). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kliever and Fergason, to provide an image from gamma radiation detectors that provides a quality radiation image using known structure of a collimator and scintillator. However, Kliever, Fergason and Schoolman fail to specifically disclose the detector use a curved scintillator. Although, scintillators in ionizing radiation systems are well known as taught by Jeanguillaume.

In related field of endeavor, Jeanguillaume disclose a way to direct radiation to a curved scintillator crystal via a collimator. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a collimator and curved scintillator in the system of Kliever, Fergason and Schoolman, since it directs incident radiation into the scintillator and provides a better resolution image as taught by Jeanguillaume.

7. Claims 21-25 are is rejected under 35 U.S.C. 103(a) as being unpatentable over Kliever in view of Fergason, further in view of Jeanguillaume (US 5,448,073).

Regarding claims 21-23, Kliever discloses a single detector for imaging. However, Kliever and Fergason fail to specifically disclose the type of detector – area or linear. Jeanguillaume discloses the detector is a group of photo multiplier tube (see figure 11; col. 11, lines 47-65). Further, Jeanguillaume uses the group of photo multiplier tubes as a single moving detector to provide three dimensional good resolution images. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kliever and Fergason, to use a compound eye detector to provide a good resolution image signal.

Regarding claim 24, as discussed above in claim 21, Kliever discloses using a single detector for stereo imaging. Fergason disclose using a CCD. However, it well known in the art to using a single detector (group of photo multipliers) moving to provide data, as taught by Jeanguillaume.

Jeanguillaume discloses the detector is moveable through angles to provide enough coordinate information (col.2, lines 5-35) to provide a 3D reconstruction of an image. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use single detector moveable in three dimension to detect enough coordinate data to construct 3D/stereo images, as taught by Jeanguillaume, since it provides a good resolution 3D image.

Regarding claim 25, Kliever discloses using a single detector for stereo imaging produced by the signal processor. Fergason discloses using a CCD. However, it well known in the art to using a single detector (group of photo multipliers) to provide 3D data (map of the radiating emitting organ sources), as taught by Jeanguillaume.

Jeanguillaume discloses the detector is moveable through angles to provide enough coordinate information (col.2, lines 5-35) to provide a 3D reconstruction of an image. The

coordinates (3D map) correspond to all detected emission from the organ of interest. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use single detector to detect enough coordinate data to construct 3D images, as taught by Jeanguillaume, since it also provides a good resolution 3D image.

Response to Arguments

8. Applicant's arguments with respect to claims 1-30 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Elbenby et al (US 5,815,411) discloses an electro-optic vision system which exploits position and attitude;

Stanton (US 6,535,182) discloses a head mounted projection display subsystem; and

Kerr (US 6,232,602) discloses an enhanced vision system sensitive to infrared radiation.

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alicia M Harrington whose telephone number is 703 308 9295. The examiner can normally be reached on Monday - Thursday 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on 703 308 4883. The fax phone number for the organization where this application or proceeding is assigned is 703 872 9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 0956.

Alicia M Harrington
Examiner
Art Unit 2873

AMH

Georgia Epps
Supervisory Patent Examiner
Technology Center 2800